THE

AMERICAN REVIEW OF TUBERCULOSIS
ABSTRACTS OF TUBERCULOSIS

VOLUME XXI FEBRUARY, 1930 ABST. NO. 2

CONTENTS

	PAGES
Tuberculosis of Organs Other than Lungs (*concluded*)	25–26
Treatment	26–46
General: Sanatorium: Dispensary: Industrial Colony:	26–29
Surgical (phrenicectomy, artificial pneumothorax)	29–40
Light (heliotherapy, ultraviolet)	40–42
Specific (tuberculin)	42
Chemotherapy	42–46
Diseases Other than Tuberculosis	46–48

Tuberculous Rheumatism and Erythema Nodosum.—The view of Poncet, that about 50 per cent of all cases of chronic polyarthritis are of tuberculous origin, is not verified. A systematic study was made, taking into consideration the characteristics of tuberculous rheumatism, such as the inaction of salicylates, absence of endocarditis, protracted course, and a tendency to fibrous retraction and contractures, as well as the clinical classification into arthralgias, acute and subacute articular inflammation and chronic polyarthritis. Among 1,500 cases there were two found with apparent primary polyarthritis, 1 with osseous ankylosis, and in 2 other cases exudation and ankylotic polyarthritis. In the cases of arthralgia observed none revealed exudation into the joints or connective-tissue retraction and ankylosis. The author makes special note of the relation of erythema nodosum to the arthralgias. Among the 1,500 cases there were found 11 with erythema nodosum, especially in women of 18 to 33 years of age. The condition occurred not only in the early stages of tuberculosis but also well-developed cases, although it is rare in advanced tuberculosis. Frequently erythema nodosum was associated with tuberculotoxic arthralgia. Chronic polyarthrides were found in 60 cases, mostly with slight pulmonary findings, and localized mainly in the knee, foot, elbow and shoulder. Light and sun-baths and sodium iodide are recommended in treatment. The lack of action of salicylic preparations is commented upon.—*Tuberkulöser Gelenkrheumatismus und einige Bemerkungen über Erythema nodosum, S. Magnusson, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 657.*—*(H. J. C.)*

Erythema Nodosum and Phlyctenular Conjunctivitis with Hilum Tuberculosis.—Erythema nodosum, formerly entirely associated with rheumatism, is to-day considered a tuberculous manifestation by many. Phlyctenular conjunctivitis is considered almost pathognomonic of tuberculosis. The case of a boy of 4½ years is reported. He had had a negative intracutaneous tuberculin test July 24, 1924. For the following two years he had lived in the same house, but not in the same apartment, with an uncle who had active tuberculosis. In 1926 he developed measles. A few days after the disappearance of the rash a typical erythema nodosum appeared. A Pirquet test done at this time was strongly positive. About 6 weeks after the onset of the measles he developed phlyctenular conjunctivitis in

both eyes. An X-ray of the chest showed enlargement of the tracheobronchial lymph nodes, which were considered tuberculous. A Pirquet done in 1928, two years later, was markedly positive, and an X-ray showed a fibrotic hilum shadow with calcification. The child's general condition remained good. The tuberculosis associated with erythema nodosum and phlyctenular conjunctivitis is usually mild.—*Erythema Nodosum and Phlyctenular Conjunctivitis in a Case of Hilus Gland Tuberculosis, A. Tow, Arch. Pediat., November, 1928, xlv, 687.*—(*P. J. W.*)

Absurdity of Open-Air Treatment.—The beneficial effects of open-air treatment of phthisis and certain other diseases is admitted. The curative effects of this therapy are not due to the fresh air, *per se*, but to the ultraviolet rays. The discovery of glass which permits the passage of these rays is a step forward in therapeutics and with improvement in this product soon all sanatoria will use this kind of glass exclusively.—*The Absurdity of Open-Air Treatment: a Note on the Application of Ultraviolet Rays in the Treatment of Tuberculosis and Other Diseases, D. C. L. Fitzwilliams, Brit. J. Tuberc., January 1929, xxiii, 12.*—(*B. T. McM.*)

Relation of Sanatorium and Dispensary.—From the point of view of education of tuberculous patients, and indirectly the public, the tuberculosis dispensary and the sanatorium should not be isolated from one another. In the sanatorium much attention is given to teaching patients safety habits in respect of disposal of sputum and also telling them about what we may group together as environmental and personal factors affecting resistance. The object of the dispensary is early diagnosis and to see that the teaching of the sanatorium is put into practice and kept alive after the patients return home.—*Prevention of Tuberculosis. The Education of the Public, W. Brand, Tubercle, April, 1929, x, 305.*—(*W. I. W.*)

Withdrawal of Alimentary Assistance at Brussels Dispensaries.—The progressive diminution of the subsidies granted by the State for the use of antituberculosis dispensaries has obliged the latter to check, and finally almost to withdraw, the alimentary assistance formerly given to patients as a matter of course. It is of practical interest to investigate what the resulting influence has been on the frequency of dispensary visits and on their functioning. The question of whether medical consultations should be supplemented by distribution of relief has often been discussed. The Directing Committee of the *Ligue Nationale Belge contre la Tuberculose* and the dispensary directors have in principle always been partial to such "assistance." Falloise, Secretary-General of the Committee, regarded such relief an essential to effective functioning. The problem has been studied by gathering the figures relating to the clientele of the dispensaries under the Brabant section, that is, 3 urban dispensaries at Brussels, the suburban dispensary at Boitsfort, and the 3 regional dispensaries at Braire-l'Alleud, Court-St. Étienne and Vilvorde. In the first place, it must be remarked that private donations continue unabated and the Brabant Committee benefits to the extent of nearly 50,000 francs by uncounted forms of assistance. However, the total resources of the dispensaries have fallen from 680,000 francs in 1921 to 274,000 francs in 1927, about two-fifths of the original figure. The State has reduced its subsidy to one-third of the original and the province has reduced its subsidy very considerably, while the purchasing power of the franc has not increased. The restriction of alimentary relief has been progressive. At first, in 1926, it was limited to relief for the frankly tuberculous and not given to debilitated or pretuberculous children. Then relief to the noncontagious (closed) cases of tuberculosis was cut down, and finally, early in 1927, limited entirely to those with open lesions. What have been the results? Graphs are given showing the annual population of the dispensaries of Brussels and environs since the creation of the Brabant committee in 1902. From 1922 to 1926, despite the progressive reductions in the relief grants, the clientele increased from 3,575 to 4,280. During this period the Brabant committee made intensive efforts to maintain efficient service, by understandings with other agencies, by special services to the trade guilds, the hospitals, and by propaganda through the cinema and tracts, and generalization of fluoroscopic examination. These efforts were stimulated by the previous marked diminution in number of patients between 1918 and 1922. The number of cases detected and recorded continued to decrease steadily from 1922 to 1926. In spite of this, it is concluded that from 1922 to 1926 the reduction of alimentary assistance has not had a baneful effect on dispensary function. This cannot be said of the more recent and radical reduction initiated in 1927. Following it the total dispensary population dropped from 4,281 to 3,775 in one year. Actually the state of affairs is still more unfavorable than the figures show, for the falling off is especially noted in the occasional consultation cases

who rarely visit physicians. The number of patients effectively examined fell from 2,717 in July to 1,718 in August. Thus the dispensaries have lost about one-third of their population. The desertion was particularly marked in the infantile clientele, composed of the debilitated rather than frankly tuberculous, which dropped from 1,052 in January, 1927 to 397 in December. It is also among the infants that the number of new cases seen has strikingly fallen off. *Conclusions:* The strict economy imposed on the dispensaries in the matter of alimentary assistance has had the baneful repercussion which might have been foreseen,—a diminution in the number of patients. It is true that the evil has been less than was feared, thanks to maintenance of the assistance for contagious patients and to the smoothly working organization of the dispensaries. If new economies should be necessary, however, gradual rather than abrupt reductions should be brought about.—*L'influence de la suppression de l'assistance alimentaire sur la fréquentation des dispensaires de l'agglomération bruxelloise, E. Olbrechts, Rev. Belge d. l. Tuberc., March-April, 1928, xix, 79.*—(*A. P.*)

Altro Work Shops.—Fifteen years ago tuberculous sanatorium patients were advised that they could return to work after six months; now a year is regarded as merely preparatory training, with two to five years required for a cure. To lengthen the patient's stay to this extent is unwise and complicates the problems of rehabilitation; in fact, it is often difficult enough to induce patients to remain nine months. But can the returned tuberculosis patient be made self-supporting and economically useful? Many factors enter into the problem. Fortunately a large percentage of ex-patients make their own adjustments. Those that can place themselves really do best; they usually secure higher wages than the placement workers or committees, and this helps greatly. Among those who cannot place themselves, many were unequal to normal competition before developing tuberculosis. Still others are untrained, and are illiterate unskilled workers who require both trade training and physical rehabilitation. *Ex-Patients of Part Time or Uncertain Work Capacity:* Many such either stay at home or are forced to enter institutions. There is a breakdown in morale or perhaps exaggerated fear of relapse. Part-time jobs in industry are rare and difficult to secure, while light outdoor jobs are either myths or entail most scanty pay. *Organization of the Altro Work Shops:* These were started in June, 1915, to meet the need of graduated work for ex-patients living in New York City. The doctor is boss regarding hours of work. The family is assured of the necessary minimum income, made up of cash earnings, together with a check for subsidy when required. Pay is on the task basis and never less than the prevailing union wage. At first patients do not produce over one-quarter to two-thirds as much as well workers in the same time. During the first year after sanatorium treatment much effort is required to turn out half the normal capacity. However, as soon as a patient can produce acceptable work he is paid the union rate for it. The factory nurse supervises the patient at work and at rest and is the welfare worker of the establishment. The Altro Shop is well located in respect to light and air. The making of washable garments for hospitals and hotels is its main industry. At first only quiescent, negative-sputum cases were accepted, then somewhat more advanced cases, and, as a study made during the war showed 50 per cent of positive sputa among patients discharged from a large sanatorium, an annex factory was established in 1918 for this class. A year later the two were merged. Approximately 20 per cent of patients employed require permanently sheltered conditions of work, this proportion being kept down by limitation. The output of the shop is sold on value, not sentiment, to hospitals, institutions, nurses, hotels and housewives. *Earnings and Results:* During 1927 approximately 92 patients received earnings of over $80,300 and additional subsidies of $30,500. The value of sales from the year's output was over $230,000. This is not only encouraging to discharged sanatorium patients, but also to large business organizations having to deal with the tuberculosis problem among their employees. The Standard Oil Company, the New York Telephone Company, and the Metropolitan Life Insurance Company have led the way in taking back employees returned from sanatoria and, under medical supervision, providing carefully graduated work, and others will doubtless follow—*The Story of the Altro Work Shops, E. Hochhauser, New England J. M., November 8, 1928, cxcix, 915.*—(*A. P.*)

Tuberculosis Placement Work in Boston.—For the consumptive wage-earner, the most important factor in maintaining health after discharge from the sanatorium is economic security and ability to provide for himself and family. The modern methods of sanatorium treatment, with prolonged rest and idleness, are apt to be somewhat demoralizing to his character and

subsequent usefulness unless properly supplemented. The placement worker must first be thoroughly familiar with the patient's physical condition, obtained from the physician or sanatorium, and must be informed of his physical capacities and limitations. A knowledge of the patient's social condition, his needs, and his previous industrial history is also required. Furthermore, such a worker must know the industrial resources of the community and be familiar with various occupational conditions and hazards, and must enlighten employers and show them the community service rendered by giving suitable employment. In many quarters there is still hesitancy and fear of employing the tuberculous, some of which may be due to exaggeration of the danger of contact infection by our own propaganda. The Placement Bureau of the Boston Tuberculosis Association was created in 1923 under the leadership and stimulus of Dr. Hawes, and Mrs. Anna Wright was assigned to the work. In 1924 there were 120 applicants referred from various sources and in 1926 there were 343. At present two workers give full time to this service. One principal difficulty was in getting a detailed report or statement of the patient's physical condition, as in many instances he had not been examined in some months. After placing, periodic check-up examinations were instituted, and a clinic was established under Dr. Millet to carry out these as well as initial examinations of all applicants.—*The Work of the Placement Committee of the Boston Tuberculosis Association, H. Linenthal, New England J. M., November 8, 1928, cxcix, 926.*—(*A. P.*)

Central New England Industrial Colony.—The term "industrial colony" is here defined as a group of subsidized productive occupations, sufficiently numerous and varied to afford congenial and healthful employment to workers of a wide range of competency, who require continued hygienic living and will accept the medical and hygienic regulations and conditions provided. The industrial colony now operated in Rutland, Massachusetts, in connection with the Central New England Sanatorium, Inc., is described. The institution has taken over four contiguous farms totalling almost 600 acres, with an approximate altitude of 1,200 feet, and a gentle slope to the South suitable for extensive buildings. The main building is within 1,000 feet of a railroad station. There are public water supplies and electrical transmission lines, and the institution is located in a town where over 1,000 persons are constantly under treatment for tuberculosis in government or private institutions, which town is only 12 miles from New England's third largest industrial city, Worcester. Plans have been made for 250 residential colonists with or without families, in dormitories, cottages or homesteads. About half the total tract, mostly on the northern slope, is woodland. Industrial shops have been planned, also a central power-house, storehouse and garage. The industrial superintendents and personnel will be housed in buildings arranged about a quadrangle headed by a central administration building and assembly hall. All traffic will pass through one main artery under control of a ground superintendent at a main gate. Another group will be an attractive colony of 16 cottages for private patients close to a private infirmary. At present about one-half million dollars are invested and the complete colony will require two million. At present there are 12 buildings and 80 patients, who, while for the most part simply following sanatorium treatment, present a problem as to after-care. The per capita cost of subsistence for working patients is now $19.14 a week, even though they are incompletely occupied. Most of the workers are absorbed in activities common to all sanatoria. The chief separate undertaking is a wood-working shop. The total number of working patients is 36 (25 male and 11 female) of whom one-third had received treatment at the institution. Lists of occupations are itemized. *Reasons for Industrial Colonies: 1:* The average home finds it a hardship to supply the necessary hygienic elements. *2:* Most commercial industries are located with little or no regard for physical and climatic advantages. *3:* Many occupations are unsuitable for ex-patients because of confinement, crowding, irritant dust, overheating, lack of fresh air, etc. *4:* In many cases an unfortunate separation from the family is obviated. *5:* Opportunities for liberating productive ability are offered. *6:* Children already extensively exposed to infection may be watched and supervised. (Parents with still positive sputa may not live with the family.) *7:* Under ordinary conditions the patient's anxiety to better his economic condition and that of his family readily leads him to undertake too much; on the other hand, over-apprehensive individuals go ahead too slowly. The subtle, insidious character of tuberculosis easily deceives the patient as to his ability to work in the absence of frequent expert supervision and examination. *8:* Drolet, basing his opinion on an analysis of 96,000 patients in tuberculosis institutions in 1925, believes most sanatoria are making too few progressive improvements in policy

and are too self-satisfied. Little progress has been made in overcoming the disadvantages of the usual too-short stay. Most patients now working at Rutland left other institutions because the routine became irksome. *9:* Many patients leave sanatoria without any adequate functional test. The industrial colony is the soundest means of meeting this problem. *10:* Organized labor is generally unfavorable to part-time employment in industry and the workmen's compensation laws of Massachusetts are hostile to subsidizing persons incapacitated with tuberculosis. Certain states, as Wisconsin, it is true, take a different view. *Relations of Industrial Colonies to Vocational Rehabilitation:* Massachusetts in 1921 utilized the provisions of an Act of Congress and established a State Board for Vocational Education to establish, maintain and assist suitable courses. Inmates of state institutions are ineligible, and altogether the number of disabled tuberculous who use this service is small, for various reasons. *Experiences with the Rutland Colony:* Breakdowns have been only slightly more numerous than among comparable individuals at rest and the patients have generally been contented. Not over 5 per cent have been prepared to contribute financially toward maintenance when their work failed to pay their way. Fully half have presented problems due to lack of experience, incorrigibility, or strange social conceptions, yet many of these have been solved so far as to surprise those in touch with them. There is a frequently recurring mental attitude or rebellious emotional reaction against their lot which cannot be disregarded. The patients in the woodworking shop earned a per capita average of $20.59 per week, working a little over six hours per day, and the average per capita deficient was $23.19 per week. The average weekly earnings for males employed in Massachusetts industries in 1928 was $29.04, and for females $16.25. The average per capita cost of weekly maintenance in 198 United States institutions in 1925, representing 32,073 beds, was $21.60. However, the funds accruing to the use of the patient and his family must be considered to partly offset the deficit, which in time will doubtless be reduced. If all occupations including subsistence deficits for the institution are averaged, the net weekly per capita deficit is reduced to $12.24.—*The Place of the Industrial Colony in Getting the Consumptive Back on the Job, B. T. Crane, New England J. M., November 8, 1928, cxcix, 918.*—(*A. P.*)

Surgical Treatment of Pulmonary Tuberculosis.—Archibald began this work in 1912 and has had under his care a total of 154 patients, all but two operated on since August, 1914. With few exceptions these have been followed up to within a few months and closely observed, intimate details of their histories being available. Although at the beginning one-stage operations were not uncommon, Archibald never operated in less than two stages, and sometimes three or more are advisable. He always combines general with local anaesthesia, using gas and oxygen, with morphia before and after operation. The usual type of case suitable for operation is the chronic, chiefly unilateral, fibrotic and ulcerative, without complications or any active process in the good lung. There should be a fund of resistance, as indicated by fibrosis. In addition, there is ordinarily some bronchopneumonic infiltration, either held *in statu quo* or undergoing cavitation or fibrous transformation. Pneumothorax has usually been attempted but found impossible or inadequate. Marked retractions of organs and narrowing of the intercostal spaces are commonly observed. One hopes for a clean slate on the good side but rarely finds it. Provided, however, that the lesions there are old, definitely quiescent, not extensive, and preferably not in the lower lobe, they do not contraindicate operation. There should, of course, be no serious lesion of other important organs, but chronic tuberculous laryngitis and enteritis are not of necessity contraindications if there is good resistance. The proper selection of cases belongs largely to the qualified internist and requires prolonged observation, careful consideration, and expert physical diagnosis and roentgenographic interpretation. The "good chronics," unilateral or chiefly unilateral, usually with cavities, are for long periods afebrile, without material increase in pulse-rate. Nevertheless, they are open cases and potentially a menace to the community, as well as being exposed to serious dangers of relapse. Under ordinary conditions they must spend the rest of their days as invalids in sanatoria or at home. Despite the cheery optimistic literature freely provided, they are apt to get hold in the follow-up section of annual sanatorium reports of disquieting figures and the *spes phthisica* is hard put to it. The patient wonders if nothing more can be done, and indeed the experience of the past ten years does not reveal that physicians are as alive as they should be to the possibilities of surgery. In the "good chronics" the balance is all in favor of operation. Later on it may not be so favorable. *1: "Good Chronic" Cases:* These number 31 of the series, of which two died, one of typhoid fever. Of 21 operated on over eighteen

months ago, 10 are practically cured and all the rest distinctly improved. *2: "Slipping Chronic" Cases:* The lesions are similar but more extensive; there is intermittent subfebrile temperature and the pulse-rate is 10 or 20 beats above normal. There may be bouts of fever lasting several weeks or mild pleuritic attacks. The sense of well-being is lost; cavities are increasing or other lesions spreading slowly. There may have been a "flare-up," with a small "snowstorm" running out from the hilum, perhaps largely cleared up under six months' bed rest, or a sharp allergic exudate around old foci. The clinician knows the darkened prognosis and may suggest pneumothorax, which may bring the patient up into the "good chronic" group. If not, nevertheless operation is to be advised. Of 41 such cases, 9 (22 per cent) are dead, 5 of these from operation, the others from progress of the disease. Nine (22 per cent) are practically cured, the others more or less improved. *3: "Bad Chronic" Cases:* These show steadily advancing disease limited fairly well to one lung. There is increasing cavitation, with purulent sputum and fever well over 100°F. for months, with elevated pulse, poor color, and loss of weight. Gradual disintegration of the bad lung is occurring, with occasional invasion of new areas and failing resistance. Still operation is advisable, in view of the fact that a few do very well, while most obtain a worth-while improvement. Of 24 such, 14 died, 6 were markedly improved, 2 were practically cured, and 2 are pursuing an unfavorable course unchanged. Six of those who died succumbed directly or indirectly to the operation, the interval being from two days to four months. All would most certainly have died without operation. *4: Marked Unilateral Cavitation with Fibrosis:* These patients are chronics of very long standing and we can assume the presence of myocarditis. They suffer from dyspnoea and the pulse is elevated, the temperature subfebrile. Sputum is profuse, cough distressing. Of 5 such operated on, 3 died within two weeks and the other two within a year. Thus surgery appears inadvisable in the presence of huge cavitation. *5: Limited "Apical" Disease:* The lesion in these may extend to the second or third interspace, is well defined and encloses a fairly large cavity. Sauerbruch in such cases advocates a preliminary pneumothorax, after which he resects the ribs over the upper half and then allows the lower lung to reëxpand. Archibald obtained one excellent result by such a procedure. *6: Lower-Lobe Disease:* Archibald has had one case of marked improvement by phrenicotomy but expects to have to resect the lower ribs later. *7: Cases of Bilateral Disease: A: With Preceding Invasions of Good Lung (within a year or two):* A detailed history and a good series of X-ray films is necessary. The latter should not be relied on exclusively, since very ugly looking "snowstorms" may clear up amazingly and a clinical estimate of the course of the disease and the resistance is important. Archibald prefers to wait six months because the strain of operation is liable to provoke to fresh activity recent lesions while old stuff can stand it. He begins with a test phrenicotomy. There were 16 such, in 5 of whom operation was postponed two to eight months; two of these recovered from flare-ups and are well. Of the remaining 11, three died, all within a few weeks, 3 struggled through flare-ups and are doing well, 2 survived acute invasions but are worse, 3 came through well but one of these later died of haemorrhage. *B: With Areas of Activity in the Good Lung:* These should not be operated on, save exceptionally when the suspected area is very limited, in which case a test phrenicotomy may be tried. Of 4 such, the course in 2 forbade operation, one is waiting, and one was operated on and died of acute invasion of the good lung. The risk is great. *8: Cases of Previously Induced Pneumothorax:* When the disease is of the early exudative form, if the pneumothorax is total or subtotal, and there are no uncollapsed cavities, it should be sufficient, but if the disease was chronic, with cavitation, Archibald fears rupture of the cavity, especially if it remains uncompressed, and advises thoracoplasty. When band-like adhesions draw out cavities this danger is imminent. Adhesions not attached to cavities should be liberated, preferably by open incision. *9: Persistent Pleural Exudates:* Probably all these are tuberculous, and often a transition from a clear to a turbid fluid and to frank pus can be observed. Total thoracoplasty is advised in such cases, preferably before the empyema stage is reached. Of 7 such cases operated on, 4 are practically cured and none died. Likewise total thoracoplasty is advised in mixed-infection empyema; of 4 such operated on, 2 are well, one with a bronchial fistula, and 2 need further resections. Septic empyema is the most desperate problem. Of 13 reported on, 8 are dead; 7 of these were treated only by drainage, as a last resort. One of the others is well after extrapleural thoracoplasty, and 3 improved, but two still under treatment. Preliminary drainage is advised, to be followed by thoracoplasty if they improve sufficiently. The paper was discussed by Lord Whittemore, Churchill and others.—*The Selection of Cases of Pulmonary Tuber-*

culosis for Surgical Intervention, E. W. Archibald, New England J. M., November 22, 1928, cxcix, 1025.—(*A. P.*)

Thoracic Surgery.—Surgery can afford the most dramatic assistance to the physician in disease of the lungs, bronchi, mediastinum and pleura in cases otherwise grave or even hopeless. Efficient and adequately coördinated team-work between physician and surgeon is very essential, but the physician should in the end be the predominant partner. The radiologist, bacteriologist, haematologist, biochemist and anaesthetist play important rôles in the performance of successful surgery in chest diseases, and nursing care is a vital factor in these cases. Carson, in 1820, foresaw the benefit likely to result from collapse of the diseased lung by pneumothorax. Adhesions at the site of incision caused failure of both his attempts to carry out this procedure. Cayley, in 1885, had an open pneumothorax induced by Gould to try to arrest severe haemoptysis. Cavities were drained in England as long ago as 1844 by Hastings and Storks. Lawson removed diseased portions of a tuberculous lung in 1893 and Macewen in 1895 removed the left lung for advanced tuberculosis and the patient was alive 18 years afterwards. Modern developments date from the last few years of the nineteenth century. They have been rendered possible by: *1:* A more accurate appreciation of the mechanics of respiration, including the intrapleural and intrapulmonary pressures, and of the part played by the mediastinum in thoracic physics. *2:* Improved methods of diagnosis, radiological, bronchoscopic, thoracoscopic and laboratory. *3:* Modern developments in anaesthesia, both local, regional and general. *4:* Rigorous selection of cases and careful preparation. *5:* Improvements in technique, resulting in saving of time and avoidance of shock, with careful nursing, dressing and after treatment. The chief ways in which surgery can aid in disease or damage of the structures of the chest are: *1:* By securing rest of the part involved. *2:* By evacuating abnormal exudate at the right time and in the most effective manner. *3:* By removing foreign bodies. *4:* By collapsing cavities. *5:* By excision or extirpation of growths or cysts. *6:* By the removal of diseased or damaged lung tissue which is beyond hope of repair, if it is sufficiently localized. *7:* By decompression, when intrathoracic pressure reactions are disturbed. *8:* By exploratory thoracotomy in obscure lung conditions. The chief measures designed to these ends may be enumerated as follows: *1:* Those designed to produce collapse or compression of diseased lung tissue: (a) artificial pneumothorax, (b) cutting adhesions, (c) thoracoplasty, especially the posterior paravertebral operation of Sauerbruch, (d) extrapleural pneumolysis, and (e) phrenic paralysis. *2:* Evacuation of intrapulmonary exudates by bronchoscopic washing, by a two-stage thoracotomy and pleurotomy. *3:* Removal of foreign bodies through the bronchoscope or by thoracotomy. *4:* Removal of new growths of the bronchi of simple character through the bronchoscope and of others, if operable, by lobecotomy. Growths in the mediastinum may be dealt with either by a transpleural route after a preliminary pneumothorax or by a direct thoracotomy. *5:* Removal of diseased or damaged lung tissue by lobectomy. *6:* Measures to secure decompression or relief of increased intrathoracic pressure, such as withdrawal of fluid or air by paracentesis and removal of ribs or cartilages, as in Brauer's operation of cardiolysis for adherent pericardium. *Lecture II:* Some of the most striking applications of surgery in diseases of the chest have occurred in connection with pulmonary tuberculosis. After an historical review of pneumothorax and thoracoplasty, indications for collapse therapy are set down briefly as follows: *1:* The more or less extensive disease of slowly progressive type and chronic course, in which X-ray shows little damage to the opposite lung. Thoracoplasty should be considered only if there is definite evidence of some natural tendency toward arrest, and if pneumothorax has failed. *2:* For repeated haemoptysis, or as an emergency. Thoracoplasty should be considered only in severe recurrent haemoptysis when pneumothorax and phrenic evulsion have failed. *3:* In cases of partial arrest with persistent positive sputum and inability of the patient to return to work. *4:* In predominantly basal lesions in which phrenic evulsion has failed. *5:* In spontaneous pneumothorax with subsequent empyema. Here thoracoplasty is required. *6:* In progressive unilateral disease, in the presence of fairly extensive more or less stationary disease of the other lung. The general use of collapse therapy in acute caseous or pneumonic tuberculosis is to be deprecated. Contraindications may be due to (1) the character and extent of the disease, and (2) the general condition and temperament of the patient. In the first group may be listed (a) extensive disease of the contralateral lung, (b) severe tuberculous enteritis, (c) laryngeal tuberculosis of the miliary type, and (d) severe renal tuberculosis. In the second group are patients with (a) poor physique and marked dyspnoea and greatly

reduced vital capacity, (b) marked cardiovascular debility, (c) severe visceroptosis, and (d) other disease, such as chronic nephritis or asthma. Cases over 60 years of age are not likely to have a successful collapse by artificial pneumothorax, and few patients over 45 are suitable for thoracoplasty. Paravertebral thoracoplasty is preferably done in two stages, with removal of a total length of 100–180 cm. of rib. Most surgeons resect the lower ribs first. At least a small section of the first rib must be removed, since this is the peg on which the others hang. The preference in England is for gas and oxygen supplemented by local anaesthesia. Sauerbruch employs local anaesthesia if the amount of sputum in 24 hours is more than 30 cc. The immediate operative risk has been reduced in expert hands from 10 to 5 per cent or less. Of 1,159 cases analyzed by Alexander cures were claimed in 36.8 per cent, while 24.4 per cent were improved and 36.8 per cent became worse or died. It is usually stated that pneumothorax fails in 30 to 40 per cent of the cases in which it is attempted. Gravesen found that when complete collapse was obtained 70.2 per cent were able to return to work, while in those with localized lesions only 11 per cent were able to do so. To increase the degree of collapse with adhesions these methods are used: (1) stretching them by increased pressure, (2) cutting them after the method of Jacobaeus (intrapleural pneumolysis), (3) extrapleural pneumolysis, and (4) paralysis of the diaphragm. The latter procedure was first proposed by Sturtz in 1911. Felix, after investigating the anatomy of the phrenic nerve, first carried out the operation of evulsion at the suggestion of Thiersch. This operation has proved of value in some cases of basal tuberculosis, also in extensive unilateral disease, and occasionally as a supplement in incomplete pneumothorax. It is useful when the lung fails to reëxpand after artificial pneumothorax is terminated. Sauerbruch carries it out before thoracoplasty to test the capacity of the sound lung. *Abscess and Gangrene:* The classification of these conditions, which in many cases appear to be only degrees and varieties of the same infectious process, may be given as follows: (1) cases originating within the bronchi, usually from aspiration of infected material; (2) those of parenchymatous origin, following pneumonia; (3) those of embolic origin; (4) those from involvement of the lung owing to the spread of suppuration from adjacent disease; and (5) those from perforating chest wounds and injury to the lung. Bronchoscopic lavage furnishes a good method of treatment, especially in aspiration cases. Operation should be avoided during the acute stage of an abscess before it has become encapsulated. The ratio of spontaneous cases is given by various observers as from 11 to 59 per cent. In subacute or chronic cases a two-stage operation may be necessary, the first to produce pleural adhesions and the second to drain the abscess. Artificial pneumothorax would appear to be suitable only for deep seated abscesses. *Bronchiectasis:* The chief surgical methods which have been suggested in the treatment of this condition are: *1:* Draining the cavity by pneumotomy, suitable only when there is a single large cavity. *2:* Ligature of the branch of the pulmonary artery to the affected lobe; this has proved of little value. *3:* Phrenic evulsion, which has been helpful in some cases. *4:* Thoracoplasty, the results of which are less satisfying than in tuberculosis, since the dilated tubes are not likely to empty and collapse. *5:* Lobectomy, not to be recommended lightly because of a mortality of about 50 per cent.—*A Medical Review of the Surgery of the Chest, R. A. Young, Lectures I and II, Lancet, March 23 and April 6, 1929, ccxvi, 593 and 677.*—*(E. H. K.)*

Thoracic Surgery.—The indications for surgical interference in pulmonary tuberculosis are presented in the usual way. It is emphasized that exudative types of lesions are not suitable for collapse therapy, but that they may become so after conservative treatment has resulted in some fibrotic reaction. It is further stated that surgical interference should be considered only after conservative treatment has failed to produce results. The first surgical attempts in pulmonary tuberculosis were those of Tuffier, who tried to drain cavities. He saved only one out of 27 cases, while Runeberg, who operated on 19 cases, lost all his patients. Tuffier and Lawson extirpated well-defined fresh tuberculous foci and entire lobes. The results were not encouraging. Quincke and C. Spengler performed local thoracoplasties, and Friedrich, following a suggestion of Brauer, removed the entire bony cage of one side. This procedure included two points of great danger, namely, the severity of the operation and, second, the causation of mediastinal flutter in cases with nonrigid mediastinum. Respiratory and circulatory disturbances frequently prevented good results. The well-known operative procedures of Sauerbruch and Wilms decreased definitely those dangers. Brauer and Harras suggested the resection of the first and second ribs and of the clavicle in isolated foci of the apical field. The method of choice at the present time is the extrapleural thoracoplasty according to Sauerbruch-Brauer. In

a few cases extrapleural apicolysis (Schlange, Friedrich) and filling with paraffin (Baer) may be done in preference to thoracoplasty. These operations are only indicated when the disease is limited to one upper lobe. Aspiration of bacilliferous sputum into the lower lobe may be prevented by phrenicotomy. Very large and stiff-walled cavities, or cavities which are surrounded by densely infiltrated pulmonary tissue and cavities near the mediastinum are usually not compressed by an extrapleural thoracoplasty. In these cases additional local operations may be necessary. In very resistant cases, Sauerbruch recommends pneumolysis and compression of the lung by packing with gauze. Adhesions which prevent collapse in pneumothorax treatment may be severed either by Jacobaeus' cauterization or by the open method according to Jessen. In the latter case one or two ribs are removed and the adhesions are ligated and cut. Phrenicotomy and phrenicoexairesis are not recommended as independent operations. Tuberculous empyemata should never be opened; pus should be removed by puncture and replaced by air. In cases of mixed infection irrigation with dyes, lugol's solution, rivanol, or Pregl's iodine solution are indicated. Such cases may, however, require extrapleural thoracoplasty in order to obliterate the cavity. For the treatment of bronchiectasis, lobar resections have been recommended. The procedure is dangerous and can only be done if the process is strictly localized to one lobe. Larger cavities, abscesses or gangrene must be treated by pneumonotomy. The various methods of compression therapy are usually not very successful.—*Entwicklung und Fortschritte in der Thoraxchirurgie, W. Denk, Wien. klin. Wchnschr., December 6, 1928, xlix, 1673.—(M. P.)*

Phrenicectomy in Pulmonary Tuberculosis.—The phthisiologist is still too often a disarmed man. A simple, relatively riskless procedure, ought to be worthy of trial in cases where, finding himself without resources, both he and the patient are agreed that something should be done. There are authors, such as Alexander, who recommend phrenicectomy in all cases of beginning tuberculosis where pneumothorax would be indicated, in preference to the latter. Alexander includes among the indications (1) Acute febrile forms, even though progressive and bilateral, when neither pneumothorax nor thoracoplasty is feasible, and (2) cases in which pneumothorax and thoracoplasty are not contraindicated but the prolongation of treatment incident to the first and the dangers of the second are to be avoided. Goetz advises phrenicectomy prior to every pneumothorax. The modifications brought about by phrenicectomy are as follows: *1:* Relative immobilization of the lung. *2:* Reduction in volume. *3:* Reduction in blood and lymph circulation. *4:* Modification in innervation through the section of sympathetic filaments. The first three are conditioned by the ascent of the diaphragm, immediate and considerable when pulmonary retractility is intact, slow and progressive when restricted by massive adhesions or alterations of the parenchyma, sometimes even nil. In the healthy lung, if the diaphragm is paralyzed, retractility is uniform, each lobe being reduced in the same proportion of its volume. Therefore, there is no reason to think that the base is selectively influenced. The results of phrenicectomy are not related to location of the lesion, but rather to its capacity for spontaneous retraction. Adhesions, even though thick, do not necessarily limit this retractile capacity. In a certain measure, even, by favoring parietal immobilization and suppressing costal respiration, they may act synergically with diaphragmatic paralysis. Very marked diaphragmatic ascents have been observed in cases of total symphysis with the diaphragm already immobilized and drawn upward. Thick interlobar bands, which would seem to interpose an obstacle, have been noted to rise parallel to the diaphragm. Operative risks are of little importance. Among incidents occurring subsequent to operation, usually in left-sided cases, are crises of palpitation and tachycardia, more marked at rest and after eating, also hemithoracic pains lasting several months, sometimes accompanied by dyspnoea. The greatest danger, however, is of postoperative exacerbations in one lung or the other. These were noted in 8 out of 107 cases. In two of these there was a fatal termination. In both the disease was in active evolution when the operation was performed. It is deemed wiser, when possible, to delay the procedure until the patients are stabilized. Although lower-lobe lesions are almost always placed first in the list of indications apical lesions are quite as often favorably influenced, localization not being as important as potential retractility. The prime indication is a severe ulcerative lesion, stabilized or slightly active, with fibrosing and retractile tendency, when pneumothorax cannot be realized or has failed. Absolute unilaterality is not essential. The ameliorations obtained from phrenicectomy as an isolated procedure, however, it must be admitted, are, in cases with any very considerable lesions, only temporary and symptomatic. There is

another category of patients, candidates for thoracoplasty, but with a tendency to bilateral involvement or in poor general condition, in whom phrenicectomy is the first step. Sauerbruch and Lange have dwelt on the advantages of phrenicectomy as a functional test of the other lung, but sometimes the test is itself harmful. There is, indeed, much advantage in preceding thoracoplasty by phrenicectomy, in order to reduce respiratory activity, preserve the lower lobe from bronchial emboli and to supplement a superior thoracoplasty. Theoretically resection of the upper eight ribs, combined with phrenicectomy, abolishes respiratory movement of the hemithorax, but the two procedures should be separated by a sufficient interval. *Report of Results:* Of 107 observations, there were 64 cases of isolated phrenicectomy, 40 not previously published. The results were estimated as follows: excellent 6 cases, quite good 15, mediocre 16, negative 19, bad 4, and unknown 4. This proportion of not quite 50 per cent frankly positive results is about the same as reported by Goetz and Fischer. The anatomical result was marked in a quarter of the cases, slight in another quarter, and insignificant or nil in one-half. Of the 40 cases not previously published 24 were stabilized and 16 active; 30 were cases in which pneumothorax was impossible, 9 abandoned, and in 1 the pneumothorax was subsequently performed. Among the 15 good results, 8 were in lesions of the right apex or middle part of the lung, and 5 of the left apex or middle part. Eight cases were previously stabilized, 7 slightly active. *Association of Phrenicectomy and Pneumothorax:* The former is indicated when the latter is insufficient or compromised by reëxpansion of the lower lobe which is the site of active lesions. When there is complete pneumothorax phrenicectomy is futile, and it may be harmful if there is any possibility of a pneumothorax on the other side as an eventuality. In some cases in which it is decided to terminate pneumothorax treatment a phrenicectomy should be performed, primarily when the lung is sclerosed, retracted and incapable of filling the pleural space. Phrenicectomy is also a useful adjuvant in closing the pleural space in cases of tuberculous empyema. *Summary: 1:* Phrenicectomy finds its best indications in ulcerative lesions, inactive and localized, with a tendency to spontaneous retraction, and in such may be curative. *2:* The results are not influenced by location of the lesion or existence of adhesions, very little by the side treated. The best results were in ulcerative apical lesions. *3:* As an adjuvant, the procedure is valuable (1) to complete an unsatisfactory pneumothorax or one compromised by subsequent reëxpansion of the lower lobe; (2) to improve the results of high or low thoracoplasty; (3) to supplement every extensive thoracoplasty; and (4) to aid the surgical treatment of tuberculous empyema. *4:* The results are more qualitative than quantitative but sometimes are quite unexpectedly remarkable.—*Les résultats de la phrénicectomie dans le traitement de la Tuberculose pulmonaire, F. Dumarest and L. Bérard, Rev. d. l. Tuberc., April, 1928, ix, 161.*—(*A. P.*)

Phrenicectomy.—The author saw no appreciable mechanical, and, as the result of this, no significant therapeutic effect, of phrenicectomy in his cases. It is recommended that the mechanical effect of artificial paralysis of the diaphragm be reinforced by compression of the lower-rib area with bandages. In earlier attempts the author used the Recklinghausen cuff, which was inflated, while later he used pillows filled with shavings and fitted to the patient's body.—*Über die rationelle Ausnützung der postoperativen Lähmung des Zwerchfelles bei der Phrenicusexairese, W. Einis, Zeitschr. f. Tuberk., 1928, l, 326.*—(*H. J. C.*)

Prenicoexairesis with Deep Accessory Nerve.—A case is reported in which phrenic evulsion yielded a phrenic nerve, which had an accessory root, which united with the main trunk 2 cm. above the peripheral arborization. It is interesting to note that the accessory was removed in such a case. This is an argument in favor of exairesis versus radical phrenicotomy.—*Phrenicusexhairese bei tiefer Vereinigung von Haupt- und Nebennerv unmittelbar über dem Zwerchfell, E. Salomon, Klin. Wchnschr., February 26, 1929, ix, 409.*—(*M. P.*)

Phrenicoexairesis for Apical Cavities.—Phrenicoexairesis in the treatment of basal lesions of the lungs is a well established and recognized procedure, but in unilateral cases with apical cavities the efficacy of this measure is not so well known. The literature on the subject is briefly reviewed. To explain the good results, Fornet's theory, based on the work of Orso, is that apical movement depends on the diaphragm and therefore, after its paralysis, the first results are evidenced at the apex. The authors claim that the results are due to a simple cicatricial contraction permitted by the inactivity of the paralyzed diaphragm and taking place at both the apex and base. Among the 20 cases reported in this study 18 had pulmonary tuberculosis with apical cavities. Of these 18 patients, 5 have been

completely cured; in all these 5 cases, the cavities, for the most part very voluminous and resisting other treatment for over a year, disappeared definitely in the course of 8 to 12 months. With 9 patients operated on more recently an important amelioration of all symptoms is evident, but sufficient time has not elapsed to permit a definite conclusion on the results. Four patients remain unchanged; they had exceptionally voluminous cavities situated in the upper lobe and were adherent peripherally to the chest wall. In the 2 remaining cases there was an artificial pneumothorax complicated by effusion. The pleurisy appeared to be favorably influenced by the phrenicectomy. *Conclusions: 1:* In all the cases there was tuberculosis with cavitation, chronic, and with a tendency to fibrosis. In most of the patients this tendency to cicatrization had already shown itself before the operation by a partial retraction of the hemithorax, by a deviation more or less marked of the mediastinum, and sometimes by a slight ascent of the diaphragm. This cicatricial tendency however was only partially satisfactory. It had not resulted in complete closure of the cavities; these cavities were patent or even increasing. This increased in spite of the tendency to fibrous contraction whose completeness is prevented by the opposition of the thoracic wall, the mediastinum and the diaphragm. In overcoming the resistance of the diaphragm the fibrous encapsulation of the tuberculous lesions can be brought about in a complete and effectual manner. This scar-formation only developed at the site of the lesions, and the healthy parts of the lung are not so affected. The greater the tendency to fibrosis the greater the retraction. In considering this mechanism it is not surprising that apical cavities may benefit most from phrenicectomy; these cavities have a much greater tendency to close than basal cavities. The reason of this is a better drainage and because of the relative immobility of the lung apex during respiration. And even with a paralyzed diaphragm, the upper parts of the lung breathe less amply than the lower, thus permitting tuberculous cavities to close more easily. *2:* The clinical indications for phrenicectomy, as formulated up to the present time, must be modified and enlarged on a considerable scale. Basal lung lesions are not the essential and principle indications for phrenicectomy. This operation must be performed on a much larger scale on all forms of tuberculous cavities of the apex presenting a tendency to fibrous contraction. It is clear that this procedure must only be resorted to when the contralateral lesions are not too advanced or too extensive, and that for some reason or other artificial pneumothorax is impossible. The presence of pleural adhesions, even though extensive, is not a contraindication; several of the cases recorded in this communication had more or less extensive fusion of the pleura. This condition has not prevented complete cure of even extensive tuberculous lesions. Admitting the harmlessness of the operation, also the extremely favorable results that have been obtained in a great many cases of tuberculous cavities which did not appear at first sight likely to benefit from this operation, phrenicectomy merits an important place among the therapeutic measures employed in phthisiology.—*La phrenicectomie dans le traitment des cavernes tuberculeuses a localisation apicale, G. E. Wolf, Ann. d. Méd., October, 1928, xxiv, 306.*—(*B. T. McM.*)

Essential Indications for Artificial Pneumothorax in Sanatoria.—How frequently and how early should Forlanini's method be resorted to in hospital and sanatorium practice? Overenthusiasts would apply such a rule as this: unilateral pulmonary tuberculosis—simple pneumothorax; bilateral pulmonary tuberculosis—bilateral pneumothorax. While such a conception may perhaps pass when dealing with patients under very unfavorable circumstances, with no means of self-support, in order to put them "on their feet in three months," it is surprising to meet with it in sanatorium physicians where conditions are of the best for prolonged observation and treatment. Among these is Thibault of Durtol. He cites the argument that the statistics of treated patients are better than of those left to their own natural defenses, Rist's figures having shown a mortality of 62 per cent among the adherent and 34 per cent among those treated by pneumothorax. Staub, of Davos, from his experience in the popular sanatoria at Zurich, concludes, contrary to many (including Naveau) that collapse therapy yields its best results in the clinically stabilized, or "cold" cases, as opposed to the toxic febrile or "hot" cases, and prefers it to thoracoplasty (1) when the lesions are not extensive, there are no large cavities and no important retractions of tissue; (2) in exudative cases, when there is danger of contralateral extension; (3) when the opposite lung is doubtful; (4) in patients too weak for thoracoplasty; and (5) in haemoptoic cases. Thoracoplasty is preferred (1) if there are marked pulmonary retractions, and (2) if there are large cavities. The chief dangers of pneumothorax consist of gas embolism, more and more rare, and pleurisy, which occurs in one-third of cases and is always undesirable, becoming purulent in

one-tenth of cases. Aseptic pleurisy is usually cured, but 5 out of 25 cases died of pulmonary exacerbations and 5 later following pleuropulmonary perforations. Septic pleurisy carries an unfavorable prognosis and necessitates thoracoplasty, for which the operative mortality ranges from nil (Staub and Ziegler) to 24 per cent (Schreiber). Should pneumothorax be established as often and as soon as possible? Certainly not. If, frightened by a triangular opacity above the right interlobar fissure, we had instituted artificial pneumothorax, we should not have known that such a shadow, in a tuberculosis patient, could disappear in ten days. Such are examples of pulmonary manifestations of Ranke's second stage, not requiring pneumothorax because they heal spontaneously. Likewise if, struck by the history of a young girl infected while caring for a brother dead of phthisis, we had collapsed a left lung largely infiltrated in its upper portion, we could not have witnessed that remarkable roentgenographic clearing, accompanied by corresponding physical and bacteriological changes, which took place under six weeks of sanatorium cure. If, in a third patient, we had induced a left pneumothorax, we could not have seen the spontaneous disappearance in two months of a cavity image, accompanied by parallel clinical and bacteriological amelioration. Attention is recalled to the communications of Jaquerod, Piguet and Giraud, Sergent, Morin and others, concerning what Bernou terms "cavities with benign prognosis." Certainly roentgenographic obliteration of pulmonary lesions, cavity or not, is more frequent than supposed, and often very rapid. Whether there is corresponding anatomical obliteration may be questioned. Giraud has noted later reappearance of some of these shadows. *Disadvantages of Delay: 1:* Risk of formation of adhesions. *2:* Risk of bilateralization of lesions. The latter is actually the greater risk, and unhappily can not be foreseen. Rist states very well the disadvantages from the veiwpoint of formation of adhesions; yet the statistics from the *Sanatorium des Alpes Vaudoises* are not strikingly convincing. They show, first of all, slightly more technical successes in women than men and slightly more on the left than on the right side; of all cases, 29 per cent were complete, 39 per cent large partial, 20 per cent partial, 12 per cent failures. In unilateral cavity cases there were 90 per cent of technical successes, and in bilateral cases with unilateral cavity 85 per cent. Intermittently subfebrile cases showed the greatest number of failures, 41 per cent. Histories of pleurisy were obtained in 43 of 126 patients, 12 serous (verified by puncture). Among the latter, 3 large partial pneumothoraces were obtained, 5 partial. Among the 27 with dry pleurisy, there were obtained 8 complete pneumothoraces, 9 large partial, 7 partial, 7 failures (*note:* this adds up to 31 cases). Among 22 patients whose disease was under six months' duration, there were obtained 32.5 per cent of complete pneumothoraces, 45 per cent large partial, 18 per cent partial, and only one failure. Among 32 of six to twelve months' duration there were 13 per cent failures, and 12 per cent among those of longer duration. On the other hand, among 36 complete pneumothoraces, 59 per cent had been established more than twelve months after onset, and the average previous duration of the disease was 19 months, compared with 39 months for the failures. Eleven of the 15 failures gave a history of previous pleurisy. Auscultation usually reveals this, while subjective pain is unreliable. Inspiratory retraction of the intercostal spaces is a reliable sign of pleural adhesions. *Summary:* It appears that we have a quasi-liberty of action, in the average case, of about six months, during which it is permissible to await spontaneous modifications, which may be sufficient,in two to five months, to counsel abstention. If within this period there is no clear-cut improvement, one should have recourse to collapse therapy. Exceptions to the above rule should be made when such incidents as rapidly increasing cavitation, unilateral extension, pleurisy, or grave haemoptysis, force our hand. The more serious the lesions, the less should one be disposed to wait. A considerable series of roentgenographs accompanies this article.—*Le médecin de sanatorium doit-il faire des pno. aussi vite et le plus souvent que possible? F. Cardis, Rev. d. l. Tuberc., April, 1928, ix, 177.*—(*A.P.*)

Paradoxes of Artificial Pneumothorax.—It is known that compression pneumothorax, employed to check haemoptysis, sometimes aggravates it. Some explain this as due to traction on adhesions, with injury to blood-vessels (Dumarest), others by blood stasis, as in incompletely collapsed thick-walled cavities (Jessen). The case of Dumarest, of a young girl, is cited, with involvement of the left lung and upper-lobe cavitation, who, following repeated haemoptyses, had a left pneumothorax induced without success; in fact, the insufflations aggravated the bleeding, so that finally the gas was removed. This patient died of recurrent haemorrhage. Lindblom has shown pathologically the frequency with which new foci develop in the collapsed lung, the pneumothorax merely favoring

fibrous encapsulation. Gwerder then reports three cases illustrating a new paradox. *Case 1:* A young woman in March, 1921, had a slight haemoptysis, with left upper-lobe involvement, which by July had spread through the upper two-thirds of this lung, with a cavity opposite the second rib. In October a left pneumothorax was commenced, a good collapse resulting, with prompt improvement; however, in June, 1923, after a rather large refill rhonchi were heard over the right upper back, and some bacillary sputum appeared. The left pneumothorax was abandoned as other symptoms appeared, and the latter subsided. In October an haemoptysis occurred, which the patient thought was from the right side and moist sounds and crackles were heard over this apex. However, an attempt had been made to resume the left pneumothorax at the time of bleeding, and this was partially kept up until July, 1924, the patient making an excellent recovery and returning home early in 1926. *Case 2:* A young man of 26 had a history of a left-sided pleurisy. Later he developed tuberculosis of the left lung with haemoptyses in the spring and summer of 1925. Roentgenographs showed a uniform density on the left, and respiration was enfeebled; the right lung was practically clear. Pneumothorax was induced on the right side instead of the left, 500 cc. at the first dose, with a refill of the same amount that evening. The haemorrhage was checked and pneumothorax gradually abandoned. A left pneumothorax would have been impossible because of the preceding pleurisy. *Case 3:* A young woman of 29 had tuberculosis of the left lung of eight years' duration, and a left pneumothorax had been unsuccessfully attempted in September, 1925. There were well-marked signs on the left side, and the films showed the left pulmonary field almost totally obscured by a diffuse opacity. In March, 1926, bloody sputum appeared, followed by profuse haemoptyses. A right pneumothorax was induced March 23, 1926. After several refills of about 300 cc., bleeding ceased. In May treatment was terminated, and there was a good recovery. *Discussion:* Gwerder does not give any very clear explanation of these results except to assume that retraction of the partially sclerotic diseased tissues may be furthered by the pressure of gas on the opposite side of the mediastinum. He also mentions the work of Neumann, associating haemorrhagic states with modifications of vagus and sympathetic influences and modifications of internal secretions. The good effects of "relaxation pneumothorax" (*pneumothorax de détente*) are emphasized. *Conclusions: 1:* There exist cases of haemoptysis in which it seems justified to throttle the haemorrhage by a gradual "relaxation pneumothorax" of the opposite or healthy side. *2:* The exceptional cases in which such a procedure is indicated are usually those in which there is a possibility of accentuating the natural contraction of the involved lung from the other side. *3:* Roentgenographic findings especially give us the indications for such procedure.—*Paradoxes du pneumothorax artificiel, Gwerder-Pedoja, Rev. d. l. Tuberc., June, 1928, ix, 361.*—(*A. P.*)

Successful Resumption of Artificial Pneumothorax after Ten Months' Interruption.—Interruption of collapse therapy generally ends in progressive resorption of the gas pocket and adherence of the pleural layers. Sometimes, unfortunately, this disappearance of pneumothorax occurs through negligence and is to be regretted when resumption is found impossible. However, a case is reported from Rist's service, in whom treatment was resumed after a lapse of ten months, with success. This patient, a young man of 26, fell ill in 1924, and when seen in June, 1925, had right unilateral pulmonary tuberculosis. Pneumothorax was established in September, 1925, and was immediately effective. By December his physician at Turin considered him cured and ceased treatment after only 20 insufflations. He resumed his work up to September, 1926, when his symptoms returned, and in October he was admitted to Rist's service at the Hôpital Laennec, presenting discrete signs at the right apex, the films showing condensation in the upper half of the right pulmonary field, with a subclavicular cavitary image, but no retractions or appearance suggesting adhesions. Without the least difficulty his artificial pneumothorax was reinstituted, and an almost total collapse of the lung obtained. Its effectiveness was confirmed by the patient's immediate improvement. This case shows that a transitory pneumothorax is not advisable, despite its initial results, which may be brilliant; compression must be maintained a long time to be permanently effective. Rist does not consider interruption of treatment within two years and only after repeated negative bacteriological findings. Nevertheless, the case also shows that the conditions following a premature re-expansion are not necessarily hopeless, and that it is worth while always to attempt to resume treatment.—*Pneumothorax artificiel réinstitué malgré dix mois d'interruption de traitement et résorption complète de la poche gazeuse, F. Hirschberg, Section d' études scientifiques de l'Oeuvre de la Tubercu-*

lose, November 12, 1927, reported in Rev. d. l. Tuberc., February, 1928, ix, 73.—(A. P.)

Abnormal Decompression in Artificial Pneumothorax.—Heretofore these occurrences do not seem to have been remarked except in connection with pleural adhesions and their consequences. This study deals with decompressions occurring independently of contact of the pleural layers and without any modification in the course of treatment with respect to dosage and interval between insufflations. Some years ago Mantoux studied the effects of altitude and pointed out the possibility of certain accidents due to this. Among possible causes of accelerated decompression is cessation of the rest cure and resumption of active life. In one patient excessive coughing seemed to play a part; in certain others the existence of a bronchopleural perforation could be established. Variations in the rate of diffusion may be traced to (1) overpressure in the pleural cavity, and (2) variations in pulmonary retractility. Whatever tends to diminish the surface of the visceral serosa diminishes the rate of diffusion, aided more or less by ischaemia; the reverse is also true. Thus we may have surprising differences in gas absorption in patients with similar degrees of collapse. The case is cited of a patient who received pneumothorax for twenty months at three-week intervals but who on resuming a quite strenuous work absorbed the gas much more rapidly. The added respiratory movements are deemed to have been responsible. In another case a severe coryza followed by strong coughing seemed to induce similar effects. Bernou is also of the opinion that about the menstrual period the diffusion of gas is accelerated, based on a careful observation of two patients. A progressive lowering of the diaphragm has also been observed, possibly attributable to vagosympathetic dystonia. Selective reëxpansion of certain parts of the lung is referred to. The effects of pleuropulmonary perforations and of partial bronchial stenoses are considered, and the view is held that the former are more frequent than generally assumed. They must be thought of when "the pleura does not hold the gas," technical faults being ruled out. *Treatment:* Careful and frequent observation is essential, especially when the patient is increasing his activities. Oleothorax is of some value in the presence of small pleuropulmonary perforations. When decompression is due to accidental factors a copious insufflation should be given. *Conclusions:* Sudden decompressions may occur in the course of pneumothorax treatment, due to various causes. Variations in pulmonary retractility, variations in the atmospheric pressure due to change in altitude, variations in the patient's activity, and bronchopleural fistulae are most important. Careful fluoroscopic observation before and after each insufflation is recommended. Copious insufflations should be given when required, and exceptionally oleothorax will be indicated.—*Des décompressions anormales du poumon au cours du pneumothorax artificiel, A. Bernou, Section d'études scientifiques de l'Oeuvre de la Tuberculose, November 12, 1927, reported in Rev. d. l. Tuberc., February, 1928, ix, 75.—(A. P.)*

Bilateral Artificial Pneumothorax.—Collapse therapy does not admit of strict definition. Optimal pressures differ with different individuals. No hard and fast law can be laid down. Too great a pressure may do harm and lead to cardiac and digestive symptoms, which often result from pressure on the mediastinum and heart. Some patients require an abnormally low pressure. In others greater pressures are required. According to Forlanini's scheme bilateral pneumothorax is impossible because he advocated complete collapse of the lung. But we know now that moderate reduction in mobility leads, not to bad results as has frequently been thought, but to definitely favorable results. Bilateral pneumothorax is now a readily acceptable procedure, although in 1912 when first introduced by the author it was frowned upon. The first important and practical gain from bilateral pneumothorax is a widening of the indications for pneumothorax. In suitable, selected cases contralateral pneumothorax might frequently be carried out with sufficient pressure to lead to healing, especially if the Jacobaeus method of cauterizing adhesions be employed when necessary. The successes of bilateral pneumothorax had led to attempts at bilateral partial thoracoplasty.—*Ueber erweiterte Indikationen der gleichzeitig doppelseitigen Lugenkollapstherapie, M. Ascoli, Deutsche med. Wchnschr., August 10, 1928, liv, 1322.—(H. S. W.)*

Bilateral Artificial Pneumothorax.—Bilateral artificial pneumothorax is extensively considered and discussed. With control observations on vital capacity, the daily amount of sputum, and stereoscopic roentgen examination, bilateral pneumothorax, with proper evaluation of the case, is harmless. The more involved lung side is first approached, and if this does not suffice or in case of progression on the other side, bilateral pneumothorax is instituted. When a complete collapse of the second side is instituted the first pneumothorax must not

be complete. With a vital capacity of 2500 cc. the second pneumothorax can be instituted without hesitation. On account of difficulty of reëxpansion of the collapsed lung, pneumothorax should not be maintained bilaterally for more than 6 to 8 months, and the least involved lung should be at first allowed to reëxpand under control of the sputum. The author reports 12 cases treated with bilateral pneumothorax with satisfactory results. The vital-capacity determination makes it appear likely that the diseased pulmonary tissue is more collapsed than the healthy tissue and that the functionating lung tissues are better utilized. —*Der doppelseitige künstliche Pneumothorax, G. Liebermeister, Beitr. z. klin. d. Tuberk., 1928, lxviii, 746.*—*(H. J. C.)*

Successive Bilateral Artificial Pneumothorax.—It was assumed for a long time that even relatively slight lesions in the contralateral lung contraindicated pneumothorax treatment on the uninvolved side, but experience has shown that not infrequently lesions improve in the contralateral side under pneumothorax treatment. It is, therefore, permissible and not infrequently successful to collapse first one lung for a sufficiently long period, and after this lung has reëxpanded to compress the other lung. Three patients are reported in detail in which this procedure has been used successfully. With the example of these three cases it is shown that (1) even an excavated lesion may heal during collapse therapy of the other lung, (2) bilateral lesions may be treated successfully with successive pneumothorax on both sides, and (3) a newly developed lesion during collapse therapy may be cured by pneumothorax treatment after the primarily collapsed lung has reëxpanded.—*Der nachträgliche doppelseitige Pneumothorax, W. Neumann, Wien. klin. Wchnschr., March 14, 1929, xlii, 325.*—*(M. P.)*

Bilateral Artificial Pneumothorax and Oleothorax.—Bilateral pneumothorax has limited indications and comes into consideration only in the case of open processes that show clinical or roentgenological cavities. The simultaneous bilateral pneumothorax can be given either alternately or coincidently, and for this purpose a Grass apparatus in modified form is used. Fifteen cases of bilateral pneumothorax, studied over a period of two years, are reported. In five with early infiltration a complete collapse was obtained, as well as in four additional cases after thermocauterization of adhesions. Two cases became free from bacilli, one enjoyed transient improvement, and another died from empyema resulting from rupture of a cavity. In the second group of patients only partial compression was obtained on account of widespread adhesions. Oleothorax produces collapse of longer duration, and requires fewer fillings. The author prefers sterilized iodipin, on account of the shadow cast in the X-ray. A 5 to 10 per cent iodipin was used, in amounts up to 1450 cc. In cases of slight pleural changes there occurred, within 12 to 36 hours, inflammatory reactions with severe pain. These effects are seen mostly with small injections, while large amounts are tolerated without irritation. If a small exudate exists before the oil is given, the injection runs its course without complications. Oleothorax with an 8 per cent olive oil-Gomenol mixture was tried twice without result. The author summarizes his studies by recommending bilateral pneumothorax and oleothorax, when the proper indications exist, as valuable in the therapy of tuberculosis.—*Doppelseitiger Pneumothorax und Oleothorax und ihre Technik, K. Diehl, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 173*—*(H. J. C.)*

Bilateral Artificial Pneumothorax and Pulmonary Perforations.—A case is reported from the Sanatorium Edith Cavell at Obourg, Belgium, as follows: A girl of infantile aspect and in poor general condition and nutrition, with "paralytic" thorax, was admitted September 1, 1926. Appetite and digestion were impaired. She had moderate cough, worse at night, sleep disturbed by frequent micturition, bacillary sputum, strongly positive cutireaction, and subnormal temperature. Clinical examination showed a deep-seated soft lesion of the right apex and a focus at the base; on the left a few distant apical râles were audible. Fluoroscopy showed an opaque shadow in the right sternoclavicular angle and considerable clouding in the axillary region; also a similar area on the left. Initial improvement was followed by a febrile attack, with fulminating activity in the right lung, the left having meanwhile become almost normal; and a right-sided pneumothorax was induced in March, 1927, with almost complete collapse of upper and middle lobes. Nevertheless, treatment was ineffective and there was evident reactivation of the lesions on the left. On May 10th the child suddenly presented an anxious and dyspnoeic appearance. Pleural puncture induced coughing and no information was yielded. The following day dyspnoea was extreme, respirations were short and superficial and 64 per minute. Respiratory sounds on the left were enfeebled and fluoroscopy showed an incomplete pneumothorax. From the right

side 300 cc. of gas were removed with marked benefit. How did this second pneumothorax occur? It is possible that her severe coughing was responsible for the rupture. In any event, both bases soon expanded sufficiently to assure haematosis, and later a little exudate appeared in the pneumothorax spaces on both sides. *Causes of Perforations:* The compensatory emphysema which occurs in the uncollapsed parts of the lungs is thought to favor perforation by being unusually fragile. If this fragile lung tissue is pierced by the needle or trocar, it may readily rupture. This theory is opposed to that of Chabaud, who speaks of the harmlessness of puncturing sound lung. Careful fluoroscopic control is recommended to anyone wishing to practise bilateral pneumothorax.—*La collapseothérapie bilatérale: Essai d'explication de la plus grande fréquence des perforations pulmonaires au cours du deuxième pneumothorax, André and De Looze, Rev. Belge d. l. Tuberc., January-February, 1928, xix, 26.*—(*A. P.*)

Leucocytes during Artificial Pneumothorax.—The differential leucocyte picture was followed in 19 cases of pulmonary tuberculosis treated with pneumothorax. If after the first fillings a polynucleosis and shift to the left diminished, and were replaced by a lymphocytosis and eosinophilia, this indicated a favorable influence of the pneumothorax treatment and a good prognosis. The persistence of a polynucleosis and shift to the left after a number of refills, with an absence of lymphocytosis and eosinophilia, suggested an unfavorable prognosis. In the latter case pneumothorax treatment should be discontinued and other therapeutic measures sought. The blood picture is considered a good indicator of the action of pneumothorax therapy.—*Über die Morphologie des Blutes im Verlaufe der Pneumothorax-behandlung bei der Lungentuberkulose, R. Russew, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 522.*—(*H. J. C.*)

Continuous Aspiration Drainage of Chest.—The advantages of air-tight continuous suction drainage of empyemata over thoracotomies are discussed. Chief among these are shortening of the period of illness, prevention of secondary infection, less shock, continuous and complete drainage; reëxpansion of the lung is facilitated and thus diminishes the need for subsequent operations of decortication. The apparatus consists of an in'ying catheter which is introduced into the chest through a cannula. The catheter is connected by rubber tubing with a flask which is evacuated by means of a hydraulic pump. The reservoir supplying this pump empties itself into a pail at the rate of 60 to 100 drops per minute. This causes a negative intrapleural pressure of 8 mm. An important feature of the technique is the introduction on the stretch of the inlying catheter. On withdrawing the cannula the rubber releases and fills the wound, making an air-tight joint.—*Air-Tight Suction Drainage Chest, H. Burrows, Lancet, March 16, 1929, ccxvi, 549.*—(*B. T. McM.*)

Heliotherapy in Tuberculosis.—The treatment of tuberculosis with light, which a few years ago had to be frequently justified by its proponent, is now taken for granted. Exposure to sunlight leads to building up of the general strength of the body, increase in muscle tone, increase of red blood cells and haemoglobin, reduction of the polynuclear increase sometimes present, and leaves the patient strong and vigorous at the end of treatment instead of weak and debilitated as he frequently is following surgical treatment. The pigmentation which usually develops protects the body from the actinic rays and thus allows longer exposures. It is a sign of good prognosis although many exceptions are encountered. If judiciously applied, heliotherapy is of great benefit in pulmonary tuberculosis. It should not be applied to rapidly progressing or generalized tuberculosis, or in case of haemorrhage or for two weeks after haemorrhage. Heliotherapy should be combined with general sanatorium care and not used alone. Lamps of various types are fairly good substitutes during the winter months for natural sunlight, but the value of fresh, moving air (not too much chilled) must not be lost sight of.—*Treatment of Tuberculosis by Heliotherapy, H. LoGrosso, Radiology, September, 1928, xi, 217.*—(*H. S. W.*)

Physical and Biological Problems in Heliotherapy.—A study has been made of the spectral energy characteristics of the mercury-vapor lamp. A vacuum-type burner run at 110 volts A. C. was used in all investigations. Measurements of the variation of the relative intensity of the lines, 3130, 3022, 2967, 2897, 2804, 2650, and 2536 Å under varying conditions, that is, age of burner and operation, are reported. The ultraviolet emission has also been measured by a cadmium photoelectric cell in uviol glass, by the starch-iodine test, and by the skin erythema. It may be concluded from these investigations that the cadmium cell gives a satisfactory reading of the erythema-producing ultraviolet part of the mercury-vapor spectrum. A method is proposed by which the calibration of a photoelectric cell in absolute units can be carried out. This

permits checking the sensitivity of an individual cell and calibrating other cadmium cells in the same units. The correlation between this absolute unit and the biological effect (skin erythema) has been established. —*Physical and Biological Problems in Heliotherapy, E. A. Pohle and R. A. Sawyer, Am. J. Roentgenol. & Rad. Ther., October, 1928, xx, 338.*—(*W. I. W.*)

Heliotherapy Dosage.—The ultraviolet energy of sunlight is a very variable quantity, depending on time of year, time of day, altitude, humidity and other factors; therefore standardized attempts should be made to determine the intensity of the energy of the light to which the patient is exposed. Experiments made at Boulder, Colorado, determined that an hour's sun-bath at 8 o'clock might give double the dosage of a sun-bath at 7 o'clock, and although the time of exposure was increased five minutes daily, on certain days the patient received very little more, or even less, actual dosage than on the previous day. Using as the unit of intensity the time required to darken a paste of zinc sulphide in saturated lead-acetate solution to a reflection factor of 50 per cent, the determination of ultraviolet intensity at any time of the day can be made in approximately ten minutes.—*Dosage in Heliotherapy: Plea for Laboratory Control, J. R. Earp, J. Am. M. Ass., January 26, 1929, xcii, 312.*—(*G. L. L.*)

Heliotherapy at Dispensaries.—Patients while continuing their occupations received artificial heliotherapy for some forms of surgical tuberculosis. The results were satisfactory and the expense represented a considerable saving over institutional treatment. A small number of patients with pulmonary tuberculosis were treated with artificial light. The results were unsatisfactory.—*Artificial Light Treatment at Tuberculosis Dispensaries for Nonpulmonary Tuberculosis, G. L. Cox, Brit. J. Tuberc., January, 1929, xxiii, 1.*—(*B. T. McM.*)

Ultraviolet Light Treatment.—The common sources of ultraviolet light are the carbon arc, the tungsten arc and the mercury-vapor arc. The therapeutic action of ultraviolet light is of four types: (1) destructive, (2) counterirritant, (3) stimulating and (4) sedative. The destructive type of treatment is best exemplified by the Finsen-Reyn treatment of lupus. In a counter-irritant dose a definite degree of erythema should be secured; it is indicated in single chronic joint conditions. Stimulating effects are best obtained by doses of ultraviolet light that do not produce erythema. Sedative effects are produced when the dose is about 25 per cent of an erythema dose and the area of the skin exposed at each treatment is about 10 per cent of the body. Phthisical patients without pyrexia respond best to this method of treatment.—*The Present Position of Ultra-Violet Light Therapy, C. B. Heald, Brit. M. J., January 19, 1929, no. 3550, 94.*—(*W. I. W.*)

Ultraviolet Rays.—The proof is complete that sun-rays exert a curative effect in cases of surgical tuberculosis, rickets, and in some cases of nerve disease, anaemia and skin disease. Sunshine contains some of the longer ultraviolet rays, but the shorter and physiologically more active rays are lacking. The mercury arc in quartz and a carbon arc, burning carbons with mixtures of rare earth, are substitutes for the sun. Sunlight, ultraviolet rays and infrared rays, all cause pigmentation of the skin. Ultraviolet rays are largely responsible for the inflammatory reaction, although sunshine is more effective in influencing the extent and duration of pigmentation. A common effect of overdosage is sleeplessness, restlessness, lassitude, loss of weight and nausea.—*Ultra-Violet Rays and the General Public, W. E. Dixon, Brit. M. J., October 13, 1928, no. 3536, 642.*—(*W. I. W.*)

Irritation of Skin from Ultraviolet Radiation.—Severe irritation of the skin developing during artificial light treatment is not uncommon. The most common cause is a depletion of the alkaline reserve. To prevent this complication it is advisable to examine the urine before instituting this treatment. An excessive acidity may be overcome by prescribing an alkaline mixture. —*Skin Irritation Under Ultraviolet Radiation, S. V. S. Boyd, Lancet, November, 24, 1928, ccxv, 1076.*—(*B. T. McM.*)

Treatment of Tuberculosis under Reduced Atmospheric Pressure.—The increased haemopoiesis in high altitudes is due to the reduced atmospheric pressure and a coincident reduction in the oxygen retention. This factor, which has been thought to be of importance in the beneficial results obtained in high altitudes, can be reproduced at will by lowering the atmospheric pressure in a pneumatic chamber. Four patients suffering from lymph-node tuberculosis were treated daily for approximately twenty days under reduced pressure for a period of two hours a day. The reduction of pressure was equal to an elevation of 4,000 to 5,500 metres. All patients showed a considerable increase in haemoglobin, the lowest increase in one

person being 3.6 per cent, and the highest 32.8 per cent. The relatively high increase, as compared with observations in high altitudes, is probably due to the fact that the stimulus was applied frequently and that no possibility of acclimatization was given. The tuberculous process in these four patients did not show any definite improvement. It is concluded that increased haemopoiesis, as such, has no influence on the local tuberculous lesion.—*Beitrag zum Problem der Tuberkulosebehandlung in der Unterdruckkammer, W. Singer, Klin. Wchnschr., April 23, 1929, viii, 785.*—(*M. P.*)

Treatment of Pulmonary Tuberculosis with Tebeprotin.—*Tebeprotin Toenniessen* was used in 80 cases, 18 of these being predominantly exudative and mixed forms of pulmonary tuberculosis. In only one was the result questionable, while of the remaining 62 cases there were 75.8 per cent that showed good results. By proper selection and careful dosing a good effect in the reduction of fever was especially obtained in subfebrile and mildly febrile cases, leading to the conclusion that *Tebeprotin* is a valuable adjunct in the therapy of pulmonary tuberculosis. Treatment was given at biweekly intervals, starting with very small doses, and it continued over a period of 9 months in the usual case, terminating with a final dose of 1:50 mgm.—*Therapeutische Erfahrungen mit Tebeprotin-Toenniessen, T. Siekowski, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 625.*—(*H. J. C.*)

Treatment of Tuberculosis with Living Tubercle Bacilli.—The prophylactic use of living tubercle bacilli can as yet not be considered a safe procedure, but the treatment of an actively diseased person with a living vaccine appears to be safe and successful. Böhme advocates a vaccine whose virulence is decreased by sodium-chloride solution. Twenty-two patients were treated with Böhme's vaccine with altogether 124 injections. The vaccine was administered by intracutaneous injections. At the site of injection a small nodule may develop, and abscess-formation and an open sinus may follow. This occurrence is painless, and the lesion heals within a few weeks or months. This allergic reaction occurs in some patients only after several injections have been given. In most patients definite improvement was noticed, and this form of treatment is warmly advocated for wider use.—*Die Behandlung der Tuberkulose mit lebenden Tuberkelbazillen, A. Kutschera-Aichbergen, Wien. klin. Wchnschr., February 14, 1929, xlii, 197.*—(*M. P.*)

Therapeutic Tuberculous Superinfection in Skin.—A vaccine, prepared from tubercle bacilli of diminished virulence and of human type, was used in 62 cases of tuberculosis by subepidermal injection. The individual doses ranged from 100 to 200,000 bacilli and to a maximum of 24 injections in individual cases. The injections caused no febrile or focal reactions, and were without an effect upon the general well-being. The injection reactions were of four types: non-inflammatory infiltrations, inflammatory infiltrations, softening, and necrosis. The local reactions disappeared in several months, or resolved with scar-formation. In a number of cases there were bean-sized infiltrations persisting after 6 months. Repeated superinfections with the same doses resulted in a diminution of the reaction. In 2 cases anergy resulted, while in 3 there were small progressive tumors which were excised. In contrast to the Old-Tuberculin reaction the superinfection reaction reached its maximum when the O.-T. reaction had completely subsided. In addition to this, both reactions frequently ran a course not conforming to the hypersensitiveness of the individual. The extraordinary variability of the course of the vaccine reaction is believed to be an expression of the primary disposition and ability to produce immune bodies. In comparison to the guinea pig the human skin reactions were more markedly variable, and made necessary a change in the significance as compared to the animal experiments.—*Experimentelle Untersuchungen über den Verlauf und die Wirkung der Superinfektion mit Tuberkulose in menschlicher Haut, mit besonderer Berücksichtigung der bisherigen Ergebnisse im Meerschweinchensversuch, P. Wichmann, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 728.*—(*H. J. C.*)

Chemotherapy of Tuberculosis.—The author divides chemotherapeutic efforts into three classes. One attempts to find an agent which will destroy the tubercle bacilli without injuring the tissues, but this has not been achieved. The reputed action of the gold preparations is, according to newer views, not a purely bactericidal one, but rather an effect obtained through an action on the tissues. Another endeavor is to retard the growth of the tubercle bacillus in the body and thus prevent their extension. Among these efforts is included the Gerson, Hermannsdörfer and Sauerbruch dietetic treatment. As a third effort the author includes those aiming to stimulate the immune properties of the body, such as that attempted by Walbum's metallic-salt therapy. The author regards the discovery of a sterilizing therapy as unlikely, but believes

that possibilities exist in the other two directions.—*Probleme der Chemo-Therapie der Tuberkulose, F. Jessen, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 711.*—(*H. J. C.*)

Sanocrysin.—Forty-five cases in the second and third stages of pulmonary tuberculosis were treated with sanocrysin. All of these cases received a preliminary period of routine sanatorium treatment without definite improvement. Sanocrysin cannot be regarded as a specific in the treatment of pulmonary tuberculosis. In suitable cases it shortened the period of routine treatment. With sanocrysin there is a greater possibility of the improvement following institutional treatment being maintained than there is without its use. In carefully selected cases it is of value as an adjuvant to other methods of treatment. It is of definite value in clearing the better lung in bilateral disease and allowing the establishment of artificial pneumothorax on the bad side. It may also be employed with advantage in collapse therapy of any variety when there is a tendency for the good side to break down.—*Treatment of Tuberculosis of the Lungs by Sanocrysin, W. Stobie and Sheila Hunter, Brit. M. J., February 2, 1929, no. 3552, 194.*—(*W. I. W.*)

Control Observation with Sanocrysin.—Patients admitted to Forster Greene Hospital in 1927 were divided into two groups alphabetically, after excluding readmissions and those who remained less than six months. Those whose names began with the letters *A* to *K*, numbering 40, were used as a control group, while those from *L* to *Z*, numbering 50, received sanocrysin treatment. Comparing the two groups according to sex, family history, duration from first symptoms, temperature and pulse-rate on admission, presence of cavity, extent of lung involvement, and complications, the group for treatment appeared to have a more unfavorable prognosis than the control group with reference to the temperature and pulse on admission, presence of cavity and extent of lung involvement. The control group, on the other hand, contained a higher proportion of patients whose first symptoms appeared more than six months before admission. Excluding 9 cases which had had satisfactory artificial pneumothorax (5 in the control and 4 in the treated group) immediate results, as shown by the condition on discharge, indicated that in the control group there were 2 quiescent, 25 improved, 5 unchanged, and 3 worse, while in the treated group there were 18 quiescent, 24 improved, 7 unchanged and 4 worse. Negative sputum was noted in 6 of the control group and 24 of the treated group. Of the entire group, 4 of the controls and 14 of the treated were discharged as quiescent in the first nine months, and 22 of the controls and 16 of the treated cases as improved in this length of time. Eleven of the *A* to *K* group of 40, and 7 of the *L* to *Z* group of 50 were known to be dead by December 31, 1928. Of the 30 cases whose sanocrysin treatment was completed 15 were quiescent, 13 improved, 1 unchanged and 1 worse. Twenty-six gained weight and four lost weight. Of nine whose treatment was not completed because of failure to improve, diarrhoea, albuminuria, progressive loss of weight, or focal and general reactions, 2 gained and 6 lost weight. Of complications during injections there were 25 febrile or subfebrile reactions, 17 cases of well-marked or transient albuminuria, 3 of vomiting, 1 of stomatitis, 1 of neuritis, 1 of oedema of the eyelids, and 1 focal and general reaction. It is concluded that sanocrysin treated cases do better than untreated cases.—*A Control Observation with Sanocrysin, B. R. Clarke and H. G. K. Haddick, Lancet, April 6, 1929, ccxvi, 714.*—(*E. H. K.*)

Animal Experiments with Sanocrysin.—In animal experiments with sanocrysin calves reacting negatively to tuberculin were treated intravenously with various strains of tubercle bacilli and with organs (glands and spleen of guinea pigs). The treatment was given according to the directions of Moellgaard, using both sanocrysin and the Moellgaard serum. In addition digalen and caffeine were given. In another series a low-virulence strain of tubercle bacilli was used for infecting before treatment. In both these series there was found no appreciable difference between the treated animals and the controls, and there was no diminution in the virulence of the tubercle bacilli used. It is believed that the favorable results obtained by Moellgaard in his cattle experiments was due to the low virulence of the strain used. *In vitro* experiments were also not satisfactory in proving the value of sanocrysin.—*Tierversuche zur Sanocrysinbehandlung der Tuberkulose, L. Lange, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 585.*—(*H. J. C.*)

Treatment of Tuberculosis with Sanocrysin.—Sanocrysin was used on 26 patients, beginning with 0.1 gm. and increasing to 0.5 gm. gradually at 8-day intervals. The Möllgaard serum was initially used but discontinued on account of the injuries produced. Albuminuria, pyrexia, etc., are discussed. Of the severe cases only two were improved, two progressed unfavorably, and the remainder were uninfluenced.—*Zur Chemotherapie der Tuberkulose, L. Wohlberg,*

Beitr. z. Klin. d. Tuberk., 1928, lxviii, 565.—(H. J. C.)

Treatment of Pulmonary Tuberculosis with Triphal.—Triphal is a complicated gold compound with a gold content of about 44 per cent. Treatment is started with 5 mgm., and the dosage is carefully increased up to 15 mgm. Injections were given intravenously at eight- to ten-day intervals, in 36 patients with open pulmonary tuberculosis who had not responded favorably to other forms of treatment. In about 33 per cent of the cases definite improvement was noticed, such as reduction in the local signs, disappearance of sputum or bacilli, reduction in sedimentation rate, and increase of body weight. Albuminuria was never observed. Slight temporary elevations of temperature occurred. Moderate headache and fatigue were observed. Sometimes the injections caused slight focal reactions. Vomiting occurred in a few cases following injections. Only one patient showed a strong focal and general reaction. The same patient was very sensitive to tuberculin. Two patients developed toxic dermatitis. As a rule, this form of treatment yields encouraging results.—*Behandlung der Lungentuberkulose mit Triphal, F. Melion, Wien. klin. Wchnschr., February 28, 1929, xlii, 271.—(M. P.)*

Treatment of Tuberculosis with Solganol.—The toxicity of *Solganol* is less than that of other gold preparations. Injuries to the kidney were never observed, while exanthemata of the skin and oral mucous membrane were frequent but retrogressed rapidly under adrenalin treatment. The author used *Solganol*, beginning with 0.01 gm., and increasing rapidly at 5- to 10-day intervals, reaching doses of 0.3 to 1.5 gm., for a total of 3 to 8 gm., in 82 cases of tuberculosis of all stages. A favorable influence was observed in fresh forms of pulmonary tuberculosis, while in chronic cirrhotic processes a bare action was observed. The action of *Solganol* is similar to that of sanocrysin, but the former is tolerated much better.—*Über Solganolbehandlung. (Ein klinischer Beitrag zur Goldbehandlung der Lungentuberkulose), A. Freund, Beitr. z. Klin. d. Tuberk., lxviii, 606.—(H. J. C.)*

Lopion, New Gold Cure for Tuberculosis.—*Lopion*, when administered to patients with pulmonary or laryngeal tuberculosis, led to increase in weight in all and improvement of symptoms (especially cough and expectoration) in about one-half the cases.—*G. 2949 (Lopion) ein neues Goldpräparat zur Behandlung der Lungen- und Kehlkopftuberkulose, H. Schmidt, Deutsche med. Wchnschr., October 19, 1928, liv, 1757.—(H. S. W.)*

Treatment of Pulmonary Tuberculosis with Antimony.—Antimony has been used with considerable success in many diseases, such as trypanosomiasis, filariasis, leishmaniasis, bilharzia, kala-azar and leprosy, and was thought worthy of trial in the treatment of tuberculosis. The preparation used by the author was *Collosol antimonium* (Crooke's) in dosage of 1 cc. intramuscularly twice weekly. The site of the injection is the fleshy part of the flexor muscles of the forearm, the needle being inserted vertically to the depth of about half an inch. Antimony is a diaphoretic and expectorant agent, and reduces fever; it also excites leucocytosis, and has a marked bactericidal action *in vitro*. Colloidal antimony, when broken down in the tissues, yields antimony in an ionic form, which is slowly excreted and its action thereby prolonged. The effect on the local pulmonary lesion is at first to increase somewhat the moist sounds heard in the lungs. The sputum is increased, but it is usually rendered less viscid, and the cough therefore generally becomes easier. After a few weeks there is a tendency for the moist râles to dry up and disappear and the sputum to decrease in quantity. The injections first produce a moderate reaction with slight elevation of temperature that evening. But the general tendency is for the temperature as a whole to subside rapidly to normal and more rapidly than would be the case without the administration of antimony. Even moderately severe cases under the routine treatment usually have an afebrile temperature in three or four weeks. As soon as this result is achieved, the patient is allowed up for one or two hours daily, which period is gradually increased to include the whole day, with the usual rest periods. Coincident with the general improvement the weight increases rapidly and the benefits of the treatment result in its being only necessary for the patient to remain in the sanatorium ten weeks on the average. Treatment can then be carried on at the tuberculosis clinic where the patient continues to receive the injection of antimony. When the improvement is sufficient, the injection is given only once a week and discontinued when the case is considered quiescent. The patient is then kept under observation and, should recrudescence occur, treatment is at once recommenced. Haemoptysis does not occur more frequently than under any other form of treatment and is not to be viewed as a contraindication to the treatment. Three hundred and fifty cases

have had treatment for a period of two months or more; 176 had positive sputum and of these 20 have died, 13 have not improved, 117 have improved, and 25 are now quiescent. The remaining 174 cases had negative sputum, but in all other respects were typically tuberculous. Of these negative cases 1 has died, 3 are not so well, 103 have improved, and 67 are quiescent. A large number of the negative cases were treated at the clinic only. In conjunction with the antimony, asparagin is administered as an expectorant, also the tincture of *Sanguinaria canadensis* and squills and tolu. The author stresses the necessity for examining the sputum for albumen as well as bacilli, and believes that those cases of pulmonary lesions, in which the sputum is negative but in which a trace of albumen is found, granted that the other important signs and symptoms of tuberculosis are present, should be looked upon as in all probability tuberculosis and treated as such. Care of the teeth and a proper dietetic regime are mentioned.—*The Treatment of Pulmonary Tuberculosis by Antimony, P. Moxey, Brit. J. Tuberc., October, 1928, xxii, 173.*—(*J. S. W.*)

Calcium and Parathyroid Treatment of Tuberculosis.—Thirty cases of pulmonary tuberculosis received calcium or parathyroid therapy for from six weeks to twelve months. The calcium content of the blood-serum in pulmonary tuberculosis varies only within normal limits, namely, 9–12 mgm. per 100 cc. In those cases responding favorably to treatment the calcium content can be raised to the maximum of normal limits. The administration of calcium or parathyroid must be continued over a prolonged period if calcium retention is to be promoted. A combination of parathyroid extract with calcium lactate has proved as effective as any. The conclusion drawn from this study is that a definite relationship exists between pulmonary tuberculosis on the one hand and calcium metabolism and parathyroid function on the other.—*Co-Relation of Calcium Metabolism, Parathyroid Function and Chronic Pulmonary Tuberculosis (II), P. Ellman, Tubercle, March, 1929, x,* 257.—(*W. I. W.*)

Arsenic-Iron Preparations in Pulmonary Tuberculosis.—The author tested various arsenic-iron preparations in the treatment of pulmonary tuberculosis, and did not find that arsenic-duploferrin possessed any particular advantages over the other arsenic-iron preparations. The leucocyte picture was not influenced, nor did it permit any prognostic deductions in so far as future ability to work was concerned.—*Über Arsen-Duploferrin und einige andere, ähnliche Arsen-Eisenmittel bei Lungentuberkulose. Zugleich ein Beitrag zur Frage des weissen Blutbildes, A. Rüberg, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 480.*—(*H. J. C.*)

Treatment of Tuberculosis with Vigantol.—Synthetic oils may be irradiated with ultraviolet light and thus be rendered capable of curing rickets. Such a fact marks a great advance, because it makes prophylactic treatment with light available to many people and prevents the congregation of people in crowds which favors spread of infection (measles, pertussis) at prophylactic stations, etc. Is such a procedure possible in tuberculosis? Is it possible to treat tuberculous people in remote parts of the country by supplying them with irradiated stearine, etc.? With the introduction of *Vigantol* (description not given) on the market, experiments were begun to elucidate this point. Forty guinea pigs were infected with tubercle bacilli, and three months later were given treatment which consisted of the daily administration of 12 mgm. of this product per kilogram. The average dose to children is 10 mgm. per kilo. No deleterious results followed. Several children were then treated with doses slightly larger than the therapeutic dose for rickets. This was increased and results were gratifying. But in most of the children so treated, whether they had active or quiescent tuberculosis, there were obvious signs of renal damage, for the urine contained albumin, white blood cells and casts and sometimes red blood cells. This was usually transient. It is of more than passing interest that when this drug is given to nontuberculous, rachitic children, no such appearances occur in the urine.—*Vigantol bei tuberkulösen Kindern, Bamberger and Spranger, Deutsche med. Wchnschr., July 6, 1928, liv, 1116.*—(*H. S. W.*)

Combined Febrile and Expectorant Treatment in Pulmonary Tuberculosis.—*Neo-Toramin* (trichlorbutylmalonic acid dimethylamidophenyldimethyl-pyrazolon) is recommended as a combined antipyretic and expectorant. The action of *Toramin* in loosening secretion and acting as a sedative to cough, without having the associated undesirable affects of the narcotics of the morphine group, is well known. *Neo-Toramin* possesses an advantage over pyramidon in producing antipyretic effects in smaller doses. Since the combination *Toramin amidopyrin* differs from pyramidon in not acting directly upon the heat centre, but by exerting a sedative action upon the sleep

centre, there results an effect upon the fever without the harmful perspiration occuring with pyramidon. The dosage must be individualized. If the temperature does not exceed 38.5° 0.2 gm. of the combination is given initially three to five times a day and is gradually increased until an afebrile condition sets in. Focal or general reactions have never been observed.—*Bemerkungen zur kombinierten Therapie des Fiebers und der Expektoration bei Lungentuberkulose, M. Baumwell, Zeitschr. f. Tuberk., 1928, l, 229.*—(*H. J. C.*)

Alpha Lobelin as Respiratory Stimulant.—Alpha lobelin is a definite stimulant to the respiratory centre. Simulation is confined not to that centre alone, but affects the associated medullary centres in a like degree. The toxicity of the drug is so great that its extensive clinical use is inadvisable if not actually dangerous.—*Alpha Lobelin as a Respiratory Stimulant, W. R. Marshall, Arch. Int. Med., August, 1928, xlii, 180.*—(*W. I. W.*)

Influence of Pyramidon on Subfebrile Temperatures.—In 1916 the author reported that subfebrile temperatures caused constitutionally, and those caused by disease, can be differentiated by the administration of pyramidon. The former type is not influenced by the usual dosage of the drug. In so called juvenile tuberculosis, that is, the late form of generalized tuberculosis without localization in organs, pyramidon sometimes does not depress the subfebrile temperature. An habitually increased temperature is more frequent in this type of patient. It is quite possible that this is a coincidence and not always dependent on the presence of tuberculosis. It is then likely that the patient who does not react with a decrease of temperature upon the administration of pyramidon has a constitutionally increased temperature.—*Die Beeinflussbarkeit subfebriler Temperaturen durch Pyramidon, J. Holló, Wien. klin. Wchnschr., xlii, 369.*—(*M. P.*)

Climatic Allergens in Asthma and Tuberculosis.—The relations of climatic influences, temperature, wind, barometric pressure, humidity and rain, are believed to be solved in respect to the dust in houses of asthmatic cases which is influenced by these conditions. The dust is also altered by certain moulds, such as aspergillis, penicillium, and others, as well as mites. Intracutaneous and subcutaneous injections of extracts of dust from such "asthma" houses resulted positively in the inflicted and negatively in the nonafflicted, and therefore these substances are designated as *allergens*. Home and bed hygiene, that is, freedom from moisture and prevention of the presence of microörganisms in the bed material, are far more weighty in the treatment of asthma than all kinds of specific and nonspecific desensitization. These same conceptions can be transferred to tuberculosis in all its stages according to the newer observations of the author.—*Asthma und Tuberkulose im Zusammenhang mit Klimaallergenen, W. S. van Leeuwen, Beitr. z. Klin. d. Tuberk., 1928, lxviii, 703.*—(*H. J. C.*)

Asthma.—Physiological and histological observations were made on dogs, guinea pigs and one monkey with regard to the symptoms and changes produced by various types of stimulation of the vagi in the neck. In many cases the resultant changes in the lungs, bronchial constriction, bronchorrhoea, cellular infiltration, and emphysema were similar to that seen in asthma. The studies thus establish a physiological basis for the reflex nature of certain types of asthma. These experiments form the basis for the suggestion that in certain types of intractable asthma posterior mediastinotomy, with section of the bronchial branches of the vagi, using the extrapleural approach might be considered.—*Experimental Study of the Effects of Stimulation and Section of the Vagal Innervation to the Bronchi and their Possible Relation to Asthma, H. T. R. Mount, Am. J. M. Sc., May, 1929, clxxvii, 697.*—(*W. I. W.*)

Ephedrine in Asthma and Whooping-Cough.—Ephedrine has a definitely beneficial effect on moderate attacks of asthma, their number and severity being diminished or even completely aborted. It has no effect on severe attacks of either simple or complicated asthma. Its effect in pertussis is to relieve the violent cough, the whoop and vomiting, in mild or moderate cases; in severe cases there is no effect at all. The progress of the infection is not influenced, the relief being limited to the mechanical factor. Ephedrine appears to act by relieving the local spasm in the bronchoconstrictors. This spasm is produced by the irritant effect of the tough mucous membrane, made hypersensitive by the toxins of *B. pertussis*. By relief of this spasm the irritant mucous can be removed without the violent expiratory efforts or coughs which are usually necessary. The paroxysms are thus made shorter and less severe, and hence in favorable cases the whooping and vomiting disappear. Belladonna paralyzes the bronchoconstrictors, and thus aids the action of ephedrine, which stimulates the broncho-

dilators. If belladonna be given with ephedrine it is necessary to antagonize the "drying effect on the secretion" of the former drug by giving an expectorant. In bringing about this effect ephedrine in no way influences the course of the infection, but simply relieves the mechanical difficulty of removing the secretion and hence minimizes the exhausting efforts on the part of the child.—*The Use of Ephedrine in Asthma and Whooping-Cough, H. H. Stewart, Brit. M. J., February 16, 1929, no. 3554, 293.—(W. I. W.)*

Asthma with Colds.—The results in 97 patients, who were subject to colds and were treated with mixed streptococcus vaccine, are reported. Thirty-seven were children. Twelve of these 37 children were susceptible to colds only. Previous to treatment 43 of the patients were accustomed to have four or more colds a year, and 54 to have four or more attacks of asthma which were always associated with colds. The patients were treated periodically with a vaccine, consisting of the most prevalent types of streptococci for each respective period. Thirty-nine patients were treated or were under observation for five or more years, 28 others for four years, and 30 others for three years. Following the treatment 18 per cent of the patients were free from colds and asthma associated with colds; 12 per cent were practically free; 19 per cent had only one or two colds during the period of from three to five or more years during which they were treated or under observation, and 10 per cent were free from colds for a year or more following each course of vaccine. Therefore, 59 per cent of the patients obtained either freedom or comparative freedom from colds and asthmatic colds for a period of a year or more following each course of vaccine treatment. Sixteen per cent of the patients required more than one course of vaccine a year; their freedom from colds varied from six to eleven months after each course of treatment. In 20 per cent of the patients the results represented some combination of those already mentioned and were too complex to classify; for example, following the first course of vaccine the patient might be free from colds for months, following another practically free for a year, and following a third entirely free for a year or more. In 36 per cent of the patients, therefore, the results were satisfactory for periods of more or less than a year, and the frequency of colds was reduced by 50 or 75 per cent. Five per cent of the cases in which the patients did not show any benefit following the course of vaccine are called failures. Each year the vaccine consisted of those streptococci which represented between 85 and 90 per cent of the prevailing types. It is possible, then, that other varieties of streptococci, which were less prevalent and yet comprised from 10 to 15 per cent of those encountered, could cause colds in patients who were not entirely free from colds. A later paper will present evidence that this is the case; also that *Staphylococcus pyogenes aureus* sometimes seems to be a cause of colds.—*Colds, and Asthma Associated with Colds, J. C. Walker, Arch. Int. Med., April, 1929, xliii, 429.—(W. I. W.)*

X-Ray Treatment of Asthma.—Of 121 cases of asthma treated by X-rays, 89 derived definite benefit. The cases were grouped into three classes: class A, asthma subdivided into paroxysmal 31 and chronic 19; class B, asthma with bronchitis 53; and class C, chronic bronchitis with asthma and usually emphysema, 18. Although the ages of the patients do not appear to affect the initial results, there is a tendency to recurrence in those treated under six years of age. The average age of those treated was 40 years.—*Treatment of Asthma by Radiation, S. G. Scott, Brit. M. J., January 5, 1929, no. 3548, 9.—(W. I. W.)*

Pollen Content of Air.—Studies made through exposing greased microscopic slides to the air under different conditions of air stillness, natural air motion, and air put in motion artificially, prove that the pollen content of still air is practically nil. In a room closed for one day the pollen deposited in 24 hours on a unit of surface was only 3 as compared with about 300 deposited within thirty seconds by air behind an airplane propeller at a height of 3,000 feet. Recurrences in the case of treated patients who should remain clinically well can often be explained by a motor or railroad trip on days when the air is filled with pollen. A closed room is a good place for treatment when the outside air is laden, there being no contraindication to the use of an electric fan if the room is clean.—*The Pollen Content of Still Air: Its Relationship to the Symptoms and Treatment of Hay-Fever and Asthma, W. W. Duke, J. Am. M. Ass., December 1, 1928, xci, 1709.—(G. L. L.)*

Tuberculin in Asthma.—Within the past few years considerable interest has been awakened in the treatment of asthma with small doses of tuberculin. The credit for this is due largely to van Leeuwen, of Leyden, who, working with a large series, claims that about 50 per cent are almost completely cured and about 25 per cent improved under tuberculin treatment. As most of van Leeu-

wen's cases were adults it was considered important to try the effect of tuberculin on the asthma of children. Twenty-four asthmatic cases were therefore chosen from the children's out-patient department of St. Thomas's Hospital, all of which had symptoms for two years or longer. These cases had been treated with potassium iodide and adrenalin, and any source of infection in the mouth or pharynx had been eradicted. All cases were examined clinically and radiologically to exclude as far as possible pulmonary fibrosis and enlarged mediastinal nodes. The average age was 7.5 years and the Wassermann reaction was negative in every case. Forty-five per cent gave definitely positive Pirquet reactions. However, the treatment appeared equally efficacious whether the cutaneous reaction was positive or negative. In all cases Old Tuberculin was used, and injections were given subcutaneously once a week; 385 injections were given in all, and a general reaction was noted in 2 cases and a definite local reaction in 5. The usual procedure was to start injections with 0.1 cc. of a dilution of 1 in 1,000,000, and increase the dose on each occasion by 0.1 cc. or 0.2 cc., until 0.1 cc. of a 1 in 100,000 dilution was reached. Beyond this the dose was increased very gradually until the optimum quantity was found for each individual case. The author does not mention what the indications are that this point has been reached. When once the correct quantity is obtained, it is not advisable to increase the dosage as an attack of asthma is likely to be brought on. Two separate courses of treatment were given with an interval of two months, the average number of injections for the first course being 15 and for the second 10. Of the original 24 cases, 3 were unaffected by treatment and were discharged and 2 left the district. Thus 19 had fairly regular treatment, but only 2 of these can be said to be cured. Of the remainder, however, 15 stayed practically free from symptoms while under treatment, but lapsed to a varying degree between the courses and since treatment was discontinued. Admittedly these results are not striking and do not harmonize with van Leeuwen's claims that 50 per cent of cases are curable by this means. On the other hand the frequency and intensity of the asthmatic attacks can be diminished and this in itself is a justification for the more extended use of tuberculin in the treatment of asthma.—*Note of the Treatment of Asthma in Children with Tuberculin, T. M. Ling, Lancet, November 10, 1928, ccxv, 972.—(J. S. W.)*

Key to Abstractors

A. P.: Andrew Peters, Pittsfield, Mass.
B. T. McM.: B. T. McMahon, Loomis, N. Y.
E. H. K.: E. H. Kerper, Loomis, N. Y.
G. L. L.: G. L. Leslie, Detroit, Mich.
H. J. C.: H. J. Corper, Denver, Col.
H. S. W.: H. S. Willis, Baltimore, Md.
J. S. W.: J. Stanley Woolley, Loomis, N. Y.
M. P.: Max Pinner, Northville, Mich.
P. J. W.: Park J. White, St. Louis, Mo.
W. I. W.: W. I. Werner, Northville Mich.